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What is claimed is:

- 1 1. A fuel composition useful for a spark or a compression ignition internal
2 combustion engine, comprising:
3 a hydrocarbon fuel;
4 a combination of nitrogen-containing detergents comprising a hydrocarbyl-
5 substituted polyamine and a Mannich reaction product of an alkyl-substituted
6 hydroxyaromatic compound,
7 an aldehyde, and a polyamine having at least one reactive N-H group; and
8 optionally a fluidizer comprising a polyether, a polyetheramine, or mixtures
9 thereof;
10 wherein the weight ratio of the hydrocarbyl-substituted polyamine to the Mannich
11 reaction product is about 0.2:1 to 1:0.2; each of the nitrogen-containing detergents is
12 present at about 20-100 ppm by weight; and the weight ratio of the fluidizer to the
13 combination of nitrogen-containing detergents is less than 0.5.
- 1 2. The fuel composition of claim 1 wherein the weight ratio of the hydrocarbyl-
2 substituted polyamine to the Mannich reaction product is about 0.5:1 to 1:0.5.
- 1 3. The fuel composition of claim 1 wherein each of the nitrogen-containing
2 detergents is present at about 22-80 ppm by weight.
- 1 4. The fuel composition of claim 1 wherein the weight ratio of the fluidizer to the
2 combination of nitrogen-containing detergents is less than 0.3.
- 1 5. The fuel composition of claim 1 wherein the combination of nitrogen-
2 containing detergents is present at or greater than about 60 ppm by weight.

1 6. The fuel composition of claim 1 wherein the hydrocarbyl substituent of the
2 hydrocarbyl-substituted polyamine is derived from a polyolefin having a number
3 average molecular weight of about 900-1500.

1 7. The fuel composition of claim 6 wherein the polyolefin is a polyisobutylene.

1 8. The composition of claim 6 wherein the hydrocarbyl-substituted polyamine is
2 derived from the group consisting of ethylenediamine, diethylenetriamine, N,N-
3 dimethyl-1,3-propanediamine, 2-(2-aminoethylamino)ethanol, and mixtures thereof.

1 9. The fuel composition of claim 1 wherein the hydroxyaromatic portion of said
2 alkyl-substituted hydroxyaromatic compound comprises phenol, ortho-cresol, or
3 mixtures thereof.

1 10. The fuel composition of claim 9 wherein the alkyl substituent of the alkyl-
2 substituted hydroxyaromatic compound is derived from a polyolefin having a
3 number average molecular weight of about 400-1500.

1 11. The fuel composition of claim 10 wherein the polyolefin is a polyisobutylene
2 having at least 70% of the olefinic double bonds as vinylidene double bonds.

1 12. The fuel composition of claim 11 wherein the aldehyde is formaldehyde; and
2 the Mannich reaction product is derived from the group consisting of ethylene-
3 diamine, propylenediamine, diethylenetriamine, N,N'-dimethylethylenediamine,
4 N,N,N'-trimethylethylenediamine, N,N-dimethylethylenediamine, N,N-dimethyl-
5 propylenediamine, N,N'-dimethylpropylenediamine, 2-(2-aminoethylamino)ethanol,
6 and mixtures thereof.

1 13. The fuel composition of claim 1 wherein the hydrocarbon fuel is a gasoline or a
2 diesel fuel; and wherein the gasoline or diesel fuel optionally contains an oxygenate
3 comprising methanol, ethanol, methyl tert-butyl ether, ethyl tert-butyl ether, methyl
4 tert-amyl ether, or mixtures thereof.

1 14. A method of operating an internal combustion engine, comprising fueling the
2 engine with the fuel composition of claim 13.

1 15. A method of controlling deposits in an internal combustion engine, comprising
2 fueling the engine with the fuel composition of claim 13.